ISD Software Risk Monitoring and Control

Number: 580-SP-014-001
Effective Date: September 1, 2004
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Responsible Office: 580/Information Systems Division (ISD) **Title: Software Risk Monitoring and Control**	**Asset Type:** Sub-Process **PAL Number:** 1.4.4

Purpose

The purpose of Risk Monitoring and Control is to manage the risks of a software project by tracking them throughout the life cycle and performing risk mitigation or contingency strategies as necessary.

Scope

This sub-process is to be followed on all Information Systems Division (ISD) mission software development projects. This sub-process operates within the Project Monitoring and Control process.

Context Diagram

Software Risk Monitoring and Control
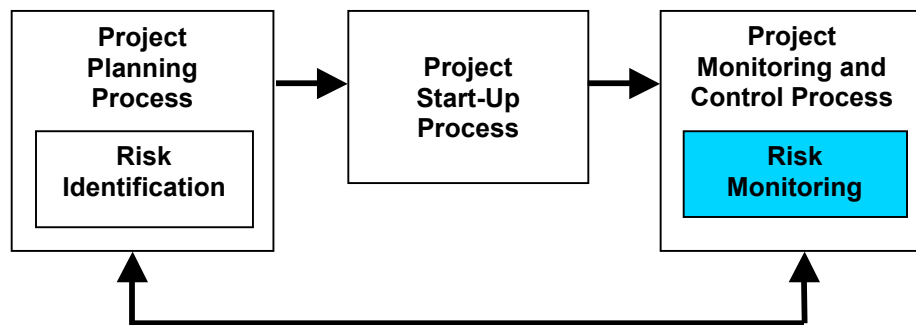
Roles and Responsibilities

Product Development Lead (PDL):

Analyze risk status

Analyze and update risk mitigation or contingency strategies

Implement risk mitigation or contingency strategies as required

Development Team Leads (If applicable):

Support the PDL in monitoring and controlling risks

GUIDANCE: Development Team Leads are used on large software project. Team Leads manage subsystems and report to the PDL.

Product Development Team Members:

Support the PDL in monitoring and controlling risks

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GSFC Division Chief and/or Branch Head and/or Project Manager:
   Review and approve the Risk Management Plan
   Conduct management reviews, including assessment of risks

Usage Scenarios	This process is entered from the Project Monitoring and Control Process, whenever a risk needs to be addressed, monitored, or tracked. There are two entry scenarios:
	
	   A periodic scheduled risk assessment is due
	   Project information is discovered or received that affects risk
	
	GUIDANCE: Risk reassessment should occur at regularly scheduled intervals. It should also be performed whenever there is a significant change in the conditions affecting the risks. Criteria that often trigger risk reassessment include:
	   Significant changes in scope, schedule, or budget
	   Identification or discovery of a new risk
	   Completion of a major phase of the software project (e.g., design).

Inputs	Risk Management Database. Information that may affect risks. *GUIDANCE: Risk monitoring includes periodic review of the Risk Management Plan in light of new information from the Project Monitoring and Control Process, and determination of any needed modifications to risk mitigation or contingency strategies based on such new information.*
Entry Criteria	Periodic risk assessment is due. OR (for re-entry) Project information is discovered or received that affects risks.
Exit Criteria	Risk Management Database has been updated, as required. Risk status has been reported to Project Management (if applicable). Risk mitigation or contingency actions have been initiated or performed, as required. Any new or revised risk mitigation or contingency strategies have been documented.
Outputs	Updated Risk Management Database Risk status (If applicable) Updated risk mitigation and/or contingency strategies.
Major Tasks	This process comprises four major tasks:

1. Analyze risks. Examine project risks in view of current project management data (PDL)
2. Analyze, update, and document risk mitigation or contingency strategies. (PDL)
3. Implement risk mitigation or contingency strategies when appropriate. (PDL)
4. Report updated risks to Project management (if applicable), and enter them into Risk Management Database (PDL)

GUIDANCE: The PDL has primary responsibility for carrying out risk monitoring and control. The Product Development Team members and, if applicable, the Development Team Leads have secondary responsibility and support the PDL in each of the Major Tasks.

Task 1

Analyze risks. Examine project risks in view of current project management data. (PDL)

a) If the entry scenario was that a periodic risk assessment was due, reassess the probability, impact, and anticipated timeframe for each identified risk.

b) If entry scenario was that new project information was received that affects risks, reassess risks based on this new project information.

GUIDANCE: Determine whether any project risks could have been affected by known recent actions on the project. Reassess the current status of each risk, including its likelihood, impact, exposure, and anticipated consequences. Look at the time frame for each risk.

c) Record any changes in risk status.

d) Review the status of any action items associated with the risk.

Task 2

Analyze, update, and document risk mitigation or contingency strategies. (PDL)

a) Review each identified risk.

GUIDANCE: Determine whether recent actions suggest any new risk mitigation or contingency strategies, or any revisions to existing risk mitigation or contingency strategies.

b) Define any new or revised risk mitigation or contingency strategies.

Define the steps of the mitigation or contingency strategy for the risk, and assign responsibility for each step to an appropriate role. Be sure to provide for sufficient lead time before the risk occurs.

Task 3

Implement risk mitigation or contingency strategies when appropriate. (PDL)

a) Perform the risk mitigation or contingency strategy appropriate for each identified risk.

b) Reassess the status of the risk following the risk mitigation or contingency actions, and update its likelihood, impact, and exposure, as applicable.

Task 4	**Report updated risks to Project management (if applicable), and maintain them in Risk Management Database. (PDL)**

a) Develop an executive overview of the updated risks, with their new or revised probabilities, impacts, and exposures.

b) Summarize the associated risk mitigation and contingency strategies.

c) Report this information to Project management (if applicable), and enter it into the approved Risk Management Database.

Measures

Recommended Measures:

On a periodic basis, collect the following risk measures separately for low-exposure, medium-exposure, and high-exposure risks:

Total number of risks

Number of new risks identified

Number of new risks with mitigation or contingency plans defined

Number if risks accepted (i.e., with no mitigation)

Number of risks successfully mitigated.

Tools and Templates

Name	Description
FSW Risk Management Database	This database may be adapted for other branches
Risk Management Tool	Branch- or Project-selected Risk Management Tool

Training

Course Name	Description
NASA Continuous Risk Management Training	Identifying project risks and planning risk mitigation strategies
Risk Management Tool Training	Use of Branch- or Project-approved Risk Management Tool

References	This process is consistent with the following policies, standards, and other references.

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NPR 8000.4: *Risk Management Procedural Requirements*

NASA-STD-8739.3: *Standard for Software Assurance*

GPG 7120.4: *Risk Management*

GPG 8700.5: *In-House Development and Maintenance of Software Projects*

580-PG-8730.3.1: *Product Development Handbook*

580-PL-002-01: *ISD Software Policies*

IEEE Std 1540-2001: Standard for Software Life Cycle Processes – Risk Management (available through: http://standards.nasa.gov/npts/login.taf at http://standards.ieee.org/catalog/olis/se.html)

Glossary: http://software.gsfc.nasa.gov/glossary.cfm
Defines common terms used in ISD processes

***ETVX Diagram*:** Link to the ETVX diagram for this process

Process Asset Library: http://software.gsfc.nasa.gov/process.cfm
Library of all ISD process descriptions

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Quality Management System Records

Controlled Document / Description	Record Custodian
Software Risk Management Plan: Approved either by itself or as part of the SMP/PP	PDL

Development History

Version	Date	Description of Development Changes
0.1	9/10/03	Initial draft (D. Schultz)
0.2	12/29/03	Additional risk management text included: tasks and entry/exit criteria (D. Schultz)
0.3	3/25/04	Recast to focus on risk monitoring (D. Schultz)
0.4	5/07/04	Revised to reflect team review comments on ETVX
0.5	5/21/04	Revised to match ISD template better
0.6	5/24/04	Revised to incorporate Linda's review comments
0.7	6/24/04	Revised to reflect team changes to ETVX
0.8	7/08/04	Incorporate team review comments
0.9	8/04/04	Incorporate team review comments
0.10	9/2/04	Incorporated CCB review comments
0.11	9/7/04	Incorporated CCB review comments
0.12	9/15/04	Incorporated post-CCB review comments

Change History

Version	Date	Description of Improvements
1.0	9/9/04	Approved by the ISD CCB

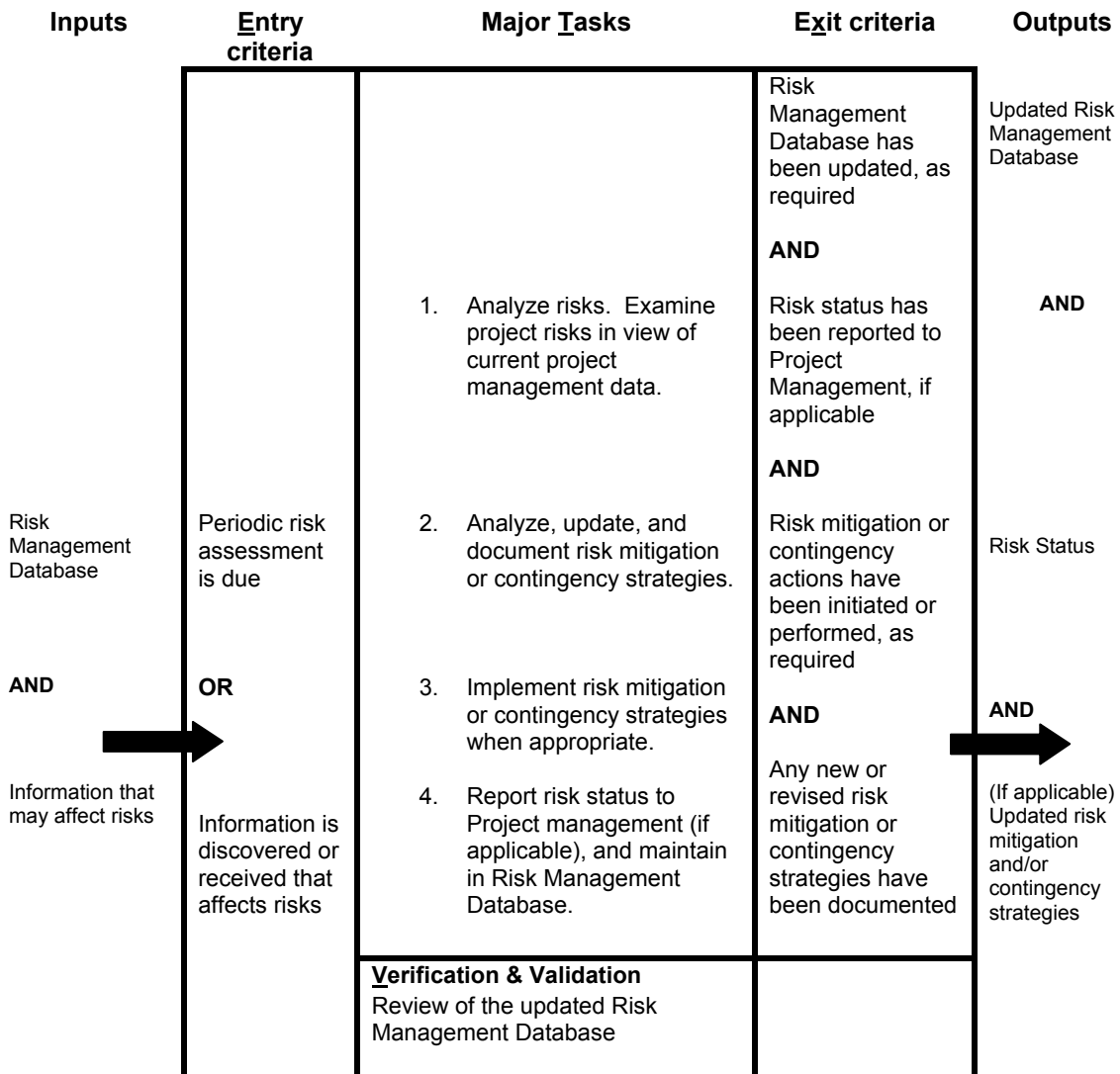# ISD Software Risk Monitoring and Control
ETVX Diagram

Number: 580-ED-014-01
Effective Date: September 1, 2004
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Approved By: (signature)
Name: Joe Hennessy
Title: Chief, ISD

Responsible Office: 580/Information Systems Division (ISD)
Title: ISD Software Risk Monitoring and Control

Asset Type: ETVX Diagram
PAL Number: 1.4.4.1

Software Risk Monitoring and Control Sub-process

Inputs	Entry criteria	Major Tasks	Exit criteria	Outputs
			Risk Management Database has been updated, as required **AND**	Updated Risk Management Database
		1. Analyze risks. Examine project risks in view of current project management data.	Risk status has been reported to Project Management, if applicable **AND**	**AND**
Risk Management Database	Periodic risk assessment is due	2. Analyze, update, and document risk mitigation or contingency strategies.	Risk mitigation or contingency actions have been initiated or performed, as required	Risk Status
AND	**OR**	3. Implement risk mitigation or contingency strategies when appropriate.	**AND**	**AND**
Information that may affect risks	Information is discovered or received that affects risks	4. Report risk status to Project management (if applicable), and maintain in Risk Management Database.	Any new or revised risk mitigation or contingency strategies have been documented	(If applicable) Updated risk mitigation and/or contingency strategies
		Verification & Validation Review of the updated Risk Management Database		

	Version	Date	Change
Development History	0.1	4/15/04	Initial draft of ETVX (D. Schultz)
	0.2	4/16/04	Revised to incorporate comments from S. Godfrey and P. Arnold (D. Schultz)
	0.3	4/26/04	Revised to incorporate editorial comments from L. Landis (D. Schultz)
	0.4	4/26/04	Revised to incorporate editorial comments from L. Landis and P. Arnold (D. Schultz)
	0.5	5/25/04	Incorporated review comments from May 25 Process Team meeting (D. Schultz)
	0.6	6/4/04	Incorporated review comments from May 28 Process Team meeting (D. Schultz)
	0.7	6/21/04	Incorporated review comments from June 15 team meeting (D. Schultz)
	0.8	7/09/04	Incorporated review comments from July 6 team meeting (D. Schultz)
	0.9	8/04/04	Incorporated review comments from July 16 team meeting (D. Schultz)
	0.10	9/2/04	Incorporated CCB review comments

	Version	Date	Change
Change History	1.0	9/9/04	Approved by the ISD CCB